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Indian Standard

SPECIFICATION FOR GRADUATED PIPETTES

PART 4 BLOW-OUT PIPETTES

(First Revision)

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July 1986

Indian Standard

SPECIFICATION FOR GRADUATED PIPETTES

PART 4 BLOW-OUT PIPETTES

(First Revision)

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Indian Standard

SPECIFICATION FOR GRADUATED PIPETTES

PART 4 BLOW-OUT PIPETTES

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part 4) (First Revision) was adopted by the Indian Standards Institution on 30 October 1985, after the draft finalized by the Laboratoryware and Related Apparatus Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was originally published as IS : 4162-1967*. Subsequently International Organization for Standardization brought out the following standards:

ISO : 835/1 - 1981	Laboratory glassware — Graduated pipettes: Part 1 General requirements.
ISO : 835/2 - 1981	Laboratory glassware — Graduated pipettes: Part 2 Pipettes for which no waiting time is specified.
ISO : 835/3 - 1981	Laboratory glassware — Graduated pipettes: Part 3 Pipettes for which a waiting time of 15 s is specified.
ISO : 835/4 - 1981	Laboratory glassware — Graduated pipettes: Part 4 Blow-out pipettes.

The Committee responsible for the preparation of this standard decided to revise IS : 4162-1967* to align this standard with the ISO standards. Accordingly this standard is now being revised in four parts: Part 1 General requirements; Part 2 Pipettes for which no waiting time is specified; Part 3 Pipettes for which a waiting time of 15 s is specified; and Part 4 Blow-out pipettes.

0.3 In this revision the following have been included:

a) Method of setting of meniscus,

b) Procedure for measurement of capacity,

---

*Specification for graduated pipettes.

c) 0·5 ml capacity pipettes with Class A accuracy for Type 4 only,

d) Pipettes for which a waiting time of 15 s has been specified,

e) Pipettes known as blow-out pipettes, and

f) Table for dimensions have been modified to bring in line with ISO Standards.

0.4 This standard contains **13.2**, which calls for agreement between the purchaser and the supplier.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 4) specifies requirements for graduated blow-out pipettes, which are suitable for specific purposes. They are adjusted to Class B accuracy.

1.1.1 The requirements specified are in conformity with IS : 8729-1977†.

1.1.2 The requirements specified in Part 1 of this standard shall apply.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in Part 1 of this standard shall apply.

3. TYPES OF PIPETTES

3.1 Graduated Pipettes — Blow-out pipettes shall be of one type as indicated below:

a) *Type 5* — Graduated pipettes adjusted for delivery of liquid from any graduation line down to the nominal capacity represented by the highest graduation line, the last drop (in the jet) to be blown out for accuracy Class B only.

4. ACCURACY

4.1 The graduated pipettes shall have B Class of accuracy only and shall conform to the requirement of 4 of Part 1 of this standard.

---

*Rules for rounding off numerical values (*revised*).

Construction and adjustment of volumetric glassware.

5. NOMINAL CAPACITY

5.1 The graduated pipettes shall be of 1 ml, 2 ml, 5 ml, 10 ml and 25 ml nominal capacities.

5.2 Procedure for Measurement of Capacity

5.2.1 The procedure given in 5.2 of Part 1 of this standard shall be followed.

6. LIMITS OF VOLUMETRIC ERROR

6.1 Errors in the delivered volume of Class B graduated pipettes shall not exceed the limits shown in Table 1 of Part 1 of this standard.

7. CONSTRUCTION

7.1 Material

7.1.1 Graduated pipettes shall be constructed from glass of suitable chemical and thermal properties, shall be as far as possible free from visible defects and shall be usually free from internal stress. When graded according to the method prescribed in IS : 2303-1963* the pipettes shall conform to Type 1 of the glass.

7.2 Dimensions

7.2.1 Graduated pipettes shall comply with the dimensional requirements given in Table 2 of Part 1 of this standard.

7.3 Finish Top of Pipettes and Delivery Jet

7.3.1 Graduated pipettes shall comply with the requirements given in 7.3, 7.3.1 and 7.3.2 of Part 1 of this standard.

8. GRADUATION AND FIGURING

8.1 Graduation pattern 3 of **8.3** of Part 1 of this standard shall be applied and typical figuring of graduation shall be as shown in Fig. 1.

8.2 Lowest graduation and lowest figured graduation lines shall be in accordance with Table 1.

TABLE 1 LOWER-END OF SCALE

SL No. (1)	NOMINAL CAPACITY (2) ml	LOWEST FIGURED GRADUATION LINE (3) ml	LOWEST GRADUATION LINE (4) ml
i)	1	0·1	0·1
ii)	2	0·2	0·2
iii)	5	0·5	0.5
iv)	10	2	1·5
v)	25	4	2·6

---

*Method of grading glass for alkalinity.

NOTE — These figures are calculated taking into account the requirement that 10 mm of uniform bore shall lie below lowest graduation line.

9. PERMANENCY AND VISIBILITY OF GRADUATION LINES, FIGURES INSCRIPTIONS AND MARKINGS

9.1 Graduation pipettes shall comply with the requirements given in **9** of Part 1 of this standard.

10. SETTING OF THE MENISCUS

10.1 Setting of the meniscus shall be performed in accordance with **10** of Part 1 of this standard.

11. DELIVERY TIMES

11.1 When the delivery time is marked on pipette, then the observed

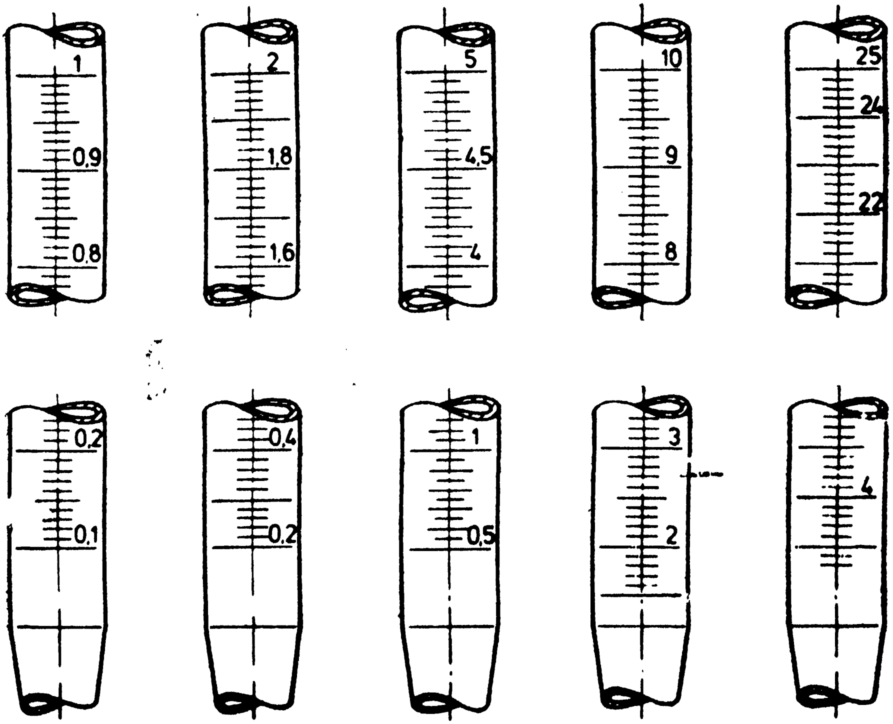

FIG. 1 GRADUATION AND FIGURING OF BLOW-OUT PIPEPPES TYPE 5, PATTERN 3

delivery time and marked delivery time shall both be within the limits given in Table 2 and shall not differ by more than 2 s.

TABLE 2 DELIVERY TIME OF BLOW-OUT PIPETTES

NOMINAL CAPACITY	DELIVERY TIME	
	Min	*Max*
ml	s	s
1	3	5
2	4	6
5	5	7
10	6	9
25	8	11

12. COLOUR CODING

12.1 If colour coding is used on the graduated pipettes it shall comply with the requirements of IS : 11468-1985* and IS : 11469-1985†.

13. MARKING AND PACKING

13.1 Each pipette shall be marked permanently and legibly on its surface with the following information:

a) Nominal capacity followed by 'ml';

b) Letter 27°C to indicate the reference temperature;

c) Letter 'B' to indicate the class of accuracy for which the pipette has been adjusted;

d) The delivery time, if any;

e) A small white ring (etched, send-blasted or of enamelled) close to the top of the pipette, in the case of blow-out pipettes. Additionally, these pipettes may have an inscription that the instrument is a blow-out pipette, for example, 'blow-out';

f) The letter 'Ex' to indicate that the pipette has been adjusted for delivery;

g) Maker's name or recognized trade-mark; and

h) A circular line 10 to 15 mm from the top and above 'Ex' to indicate it is blow-out pipettes.

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*Specification for colour coding of pipettes.

†Methods for assessing the chemical resistance of enamels used for colour coding and colour marking.

13.1.1 The pipette may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI mark on the products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

13.2 The pipettes shall be packed as agreed to between the purchaser and the supplier.

14. SAMPLING

14.1 Representative samples of the graduated pipettes shall be drawn as prescribed in Appendix C of Part 1 of this standard.

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TO
IS 4162 (PART 4) : 1985 SPECIFICATION FOR GRADUATED PIPETTES

PART 4 BLOW-OUT PIPETTES

(First Revision)

(*Page* 5; *clause* **7.1.1**) — Substitute the following for the existing clause:

'**7.1.1** Graduated pipettes shall be constructed from glass of suitable chemical and thermal properties, shall be as far as possible, free from visible defects and shall be usually free from internal stress. When graded according to the method prescribed in IS 2303 (Part 1/Sec 1) : 1994*, the pipettes shall conform to Class HGB 1 of the glass.'

(*Page* 5, *footnote marked* *) — Substitute the following for the existing:

'*Grading glass for alkalinity : Part 1 Hydrolytic resistance, Section 1 Hydrolytic resistance of glass grains at 98°C – Method of test and classification (*first revision*).'

(*Page* 8, *clause* **13.1.1**) — Substitute the following for the existing clause:

'**13.1.1** *BIS Certification Mark*

The pipette may also be marked with the Standard Mark.

13.1.1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.'

(CHD 10)

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